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TABLE 1: IR SITES AT MOFFETT FIELD

Five-Year Review Report for IR Sites 1, 22, 26, and 28, Moffett Field, California

CERCLA OU	IR Site Number	IR Site Name	Status
1	1	Runway Landfill	Third 5-year review in January 2010. Annual reporting is ongoing. O&M is ongoing.
	2	Golf Course Landfill	Closed.
2 West	8	Waste Oil Transfer Area	Closed.
	16	PW Steam Rack Sump No. 60	Soils closed. Groundwater remediation is part of Site 28.
	17	Paint Shop Sump No. 61	Closed.
	18	Dry Cleaners Sump No. 66	Soils closed. Groundwater remediation is part of Site 28.
2 East	3	Marriage Road Ditch	Unsaturated soils closed. Groundwater remediation is part of Site 26.
	4	Former Industrial Waste-water Surface Impoundments	Soils closed. Groundwater remediation is part of Site 26.
	6	Runway Apron	Soils closed. Groundwater remediation is part of Site 26.
2 East	7	Unpaved Areas Surrounding Hangars 2 and 3	Soils closed. Groundwater remediation is part of Site 26.
	10	Chase Park Area and Runway	Soils closed. Groundwater remediation is part of Site 28.
	11	Engine Test Stand Area	Soils closed. Groundwater remediation is part of Site 26.
	13	Equipment Parking Area	Soils closed. Groundwater remediation is part of Site 26.
3	12	Firefighting Training Area	Closed.
	15	Nine Sumps and Oil-Water Separators	Closed.
4	28	WATS Area	Second 5-year review in January 2010. WATS has been in operation since 1998. The Navy is evaluating the WATS program. Ongoing annual reporting.
5	26	EATS Area	Second 5-year review in January 2010. EATS has been off since July 2003. The Navy is evaluating alternative treatments. Ongoing annual reporting.
6	3	Marriage Road Ditch	Saturated soils removal completed during Site 27 channel dredging and soils removal. Groundwater remediation is part of Site 26.
	25	Stormwater Retention Pond and Eastern Diked Marsh.	Proposed Plan issued January 2009. Draft ROD submitted in April 2009. Final ROD scheduled for completion in October 2009.

TABLE 1: IR SITES AT MOFFETT FIELD (CONTINUED)

Five-Year Review Report for IR Sites 1, 22, 26, and 28, Moffett Field, California

CERCLA OU	IR Site Number	IR Site Name	Status
	27	Northern Channel	ROD signed in 2005. Channel dredging / soil removal completed January 2007. Construction completion report in progress.
N/A	5	Fuel Farm French Drains	Additional sampling planned.
	9	Old Fuel Farm	Closed.
	14	Tanks 19, 20, 67, and 68	Sampling completed. Preparing work plan for air sparging and soil vapor extraction system installation and operation.
	19	Tanks 2, 14, 43, and 53	Tanks 2, 14, and 53 closed. Tank 43 groundwater remediation is part of Site 26.
	20	Zook Road Fuel Spill	Sampling completed. Evaluating analytical results.
	21	Patrol Road Ditch	Soils removal as part of Site 27 channel dredging and soil removal. Groundwater remediation part of Site 26.
	22	Site 22 Landfill	Second 5-year review in January 2010. Annual reporting is ongoing. O&M is ongoing.
N/A	23	Golf Course Fill Area	Soils response complete. Groundwater remediation part of Site 26.
	24	Active Petroleum Sites	Closed.
	29	Hangar 1	Action Memorandum issued December 2008 selecting non-time critical removal action for PCB-contaminated siding and application of an epoxy coating to the structural steel frame.
	-	Buildings 29 and 55 Pipelines	Closed.
	-	Building 29 Additional Fuel System Components	Closed.
	-	Building 55 Sump	Preparing work plan for removal of petroleum sump.
	-	Wash Rack	Petroleum groundwater monitoring in progress.

Notes:

CERCLA Comprehensive Environmental Response,
Compensation, and Liability Act

EATS East-side Aquifer Treatment System

Moffett Field Former Naval Air Station Moffett Field

N/A Not applicable

NFA No further action

O&M Operations and Maintenance

OU Operable Unit

PCB Polychlorinated biphenyl

WATS West-side Aquifers Treatment System

TABLE 2: CHRONOLOGY OF SIGNIFICANT EVENTS FOR OU1 (SITES 1 AND 2)

Five-Year Review Report for Sites 1, 22, 26, and 28, Moffett Field, California

Event	Date
Site 2 Landfill operational	1940s to 1952
Runway Landfill (Site 1) operational	1963 to 1970s
Solid waste facility permit obtained from Santa Clara County for Site 1	1979
Confirmation study at Moffett Field	1986
Moffett Field placed on NPL	1987
UXO removed from Site1 prior to the RI (Site1 was used as a pistol range prior to 1988)	1988
Federal Facility Agreement signed	08/1989
Phase I of the station-wide RI completed with types and concentrations of chemical contaminants at 19 sites identified	08/1990
Phase II of the station-wide RI initiated – RI / FS process was separated into six separate OUs	1990
OU1 RI report	03/1993
Moffett Field was transferred to NASA, except for Moffett Community Housing, which was transferred to the U.S. Air Force.	07/1994
Trenching performed at Site 2 to define landfill boundary	04/1996
Test pits excavated at Site 2	09/1996
OU1 investigations: Additional groundwater investigations at Site1 and radiological surveys at Sites 1 and 2	09/1996
EPA concurrence letter for the consolidation of Site 2	07/1997
Remedial construction begins: Site 2 waste excavation and transfer/consolidation to Site 1	07/1997
ROD signed	08/1997
Final Site 2 Groundwater Monitoring Plan Remedial Design	03/1998
Sites 1 and 2 remedial actions completed; final inspections of Sites 1 and 2 conducted	11/1998
Site 1 Landfill Closure Plan Remedial Design	12/1998
Detection Monitoring Program began at Sites 1 and 2	07/1999
EPA Site 1 Inspection Report	11/1999
MOA signed between the Navy and NASA for institutional controls at OUs 1 and 5	11/1999
As-Built Report and RACR for Sites 1 and 2	09/2000
CIWMB Site 1 Closure Letter	03/2001
Final Site-Specific CQC Plan for Sites 1 and 2 Groundwater Monitoring and Maintenance	05/2000
Draft-Final Interim RACR for Sites 1 and 2	09/2001
Quarterly Groundwater Monitoring and Reporting for Site 1	01/2002 to 11/2004
First 5-year review signed by the Navy	09/2002
EPA Region 9 Concurrence Letter on discontinuing groundwater monitoring at Site 2	01/2003

TABLE 2: CHRONOLOGY OF SIGNIFICANT EVENTS FOR OU1 (IR SITES 1 AND 2) (CONTINUED)
Five-Year Review Report for IR Sites 1, 22, 26, and 28, Moffett Field, California

Water Board Concurrence Letter to discontinue groundwater monitoring at Site 2	02/2003
Final Technical Memorandum Site 1 Groundwater Evaluation Process	04/2004
Semi-annual Groundwater Monitoring and Reporting for Site 1	01/2005 to present
Final Site 1 Post-Closure Long-Term Maintenance Plan	04/2005
Final Site 1 Post-Closure Long-Term Monitoring Plan	04/2005
Second 5-year review completed	09/2007
Santa Clara County Department of Environmental Health Site 1 quarterly inspections	Ongoing
Annual Reports for Site 1	Ongoing

Notes:

CIWMB	California Integrated Waste Management Board
CQC	Contractor Quality Control
EPA	U.S. Environmental Protection Agency
FS	Feasibility Study
MOA	Memorandum of Agreement
Moffett Field	Former Naval Air Station Moffett Field
NASA	National Aeronautics and Space Administration
Navy	U.S. Department of the Navy
NPL	National Priorities List
OU	Operable Unit
RACR	Remedial Action Completion Report
RI	Remedial Investigation
ROD	Record of Decision
UXO	Unexploded Ordnance
Water Board	California Regional Water Quality Control Board, San Francisco Bay Region

TABLE 3: CHRONOLOGY OF SIGNIFICANT EVENTS FOR SITE 22

Five-Year Review Report for IR Sites 1, 22, 26, and 28, Moffett Field, California

Event	Date
Site 22 Landfill operational	1950 to 1967
Site 22 Landfill covered by holes 6 and 7 of the Moffett Field Golf Course	1973
Confirmation study at Moffett Field	1986
Moffett Field placed on NPL	1987
Federal Facility Agreement signed	08/1989
Phase I of the station-wide RI completed with types and concentrations of chemical contaminants at 19 sites identified	08/1990
Phase II of the station-wide RI initiated – RI / FS process was separated into six separate OUs	1990
Moffett Field was transferred to NASA, except for Moffett Community Housing, which was transferred to the U.S. Air Force.	07/1994
Site 22 investigations: soil sampling, groundwater sampling, landfill gas survey, exploratory trenching, and aquifer testing	1994 to 1997
FS for Site 22 completed	03/1999
ROD signed	06/2002
Final Remedial Design and Implementation Report for Site 22	12/2002
Construction activities at Site 22	01/ to 08/2003
Site 22 portion of the Moffett Golf Course re-opened	09/2003
Detection Monitoring Program for groundwater and landfill gas began at Site 22	11/2003
Remedial Action Report prepared for Site 22	12/2003
Final Site 22 Post-Construction OMMP	09/2003
Final Remedial Action Report for Site 22	04/2004
Draft Site 22 Post-Construction OMMP Addendum	08/2005
Final Site 22 Post-Construction OMMP Addendum	11/2007
First Five-Year Review signed	02/2008
MOA between the Navy and NASA signed	09/2008
Quarterly Groundwater Monitoring and Reporting for Site 22	Ongoing
Santa Clara County Department of Environmental Health Site 22 quarterly inspections	Ongoing

Notes:

FS	Feasibility Study
MOA	Memorandum of Agreement
Moffett Field	Former Naval Air Station Moffett Field
NASA	National Aeronautics and Space Administration
Navy	U.S. Department of the Navy
NPL	National Priorities List
OMMP	Operations, Maintenance, and Monitoring Plan
OU	Operable Unit
RI	Remedial Investigation
ROD	Record of Decision

TABLE 4: CHRONOLOGY OF SIGNIFICANT EVENTS FOR SITE 26

Five-Year Review Report for IR Sites 1, 22, 26, and 28, Moffett Field, California

Event	Date
Initial discovery of contamination, Initial Assessment Study	03/1984
Confirmation study at Moffett Field	1986
Moffett Field placed on NPL	1987
Federal Facility Agreement signed	08/1990
RI report completed	08/1993
Moffett Field was transferred to NASA, except for Moffett Community Housing, which was transferred to the U.S. Air Force.	07/1994
FS report completed	08/1995
OU 5 (Site 26) ROD signed	06/1996
Remedial Design began	04/1996
Remedial Design completed	05/1997
EATS construction started	07/1997
Final EATS Long-Term Groundwater Monitoring Plan completed	07/1997
EATS completed / operation and maintenance began	01/1999
Groundwater monitoring began	03/1999
MOA signed between the Navy and NASA for institutional controls at OUs 1 and 5	11/1999
Final EATS Operations and Maintenance Manual completed	09/2000
Final EATS Interim Remedial Action Report completed	05/2001
EPA approval of Final EATS Interim Remedial Action Report	11/2001
EATS turned off	07/2003
First 5-year review signed	02/2005
Final EATS Evaluation Report completed	02/2008
Technical Memorandum (Optimization Evaluation) for evaluating alternative remedial technologies at Site 26	08/2008
Final 2008 Annual Groundwater Report	06/2009
Annual groundwater monitoring	Ongoing

Notes:

EATS	East-Side Aquifer Treatment System
FS	Feasibility Study
Moffett Field	Former Naval Air Station Moffett Field
NASA	National Aeronautics and Space Administration
Navy	U.S. Department of the Navy
NPL	National Priorities List
OU	Operable Unit
RI	Remedial Investigation
ROD	Record of Decision

TABLE 5: CHRONOLOGY OF SIGNIFICANT EVENTS FOR SITE 28

Five-Year Review Report for IR Sites 1, 22, 26, and 28, Moffett Field, California

Event	Date
Initial discovery of contamination/Initial Site Assessment.	03/1984
Moffett Field placed on the NPL.	07/1987
Federal Facility Agreement for Moffett Field signed.	08/1989
West-side Groundwater Site Characterization Report completed.	03/1993
Federal Facilities Agreement Amendment signed, whereby Navy agrees to adopt MEW ROD for the contamination located in the area north of Highway 101 that has commingled with the MEW regional groundwater contamination plume.	12/1993
Moffett Field was transferred to NASA, except for Moffett Community Housing, which was transferred to the U.S. Air Force.	07/1994
Building 88 was demolished.	1994
Soil excavation and treatment from below Building 88.	1994-1995
Site 9 source control measures operated.	1994-1998
EPA approved remedial design.	06/1997
WATS groundwater extraction and treatment system startup.	11/1998
EPA approved Operation & Maintenance Plan.	10/2000
EPA approved Final WATS Interim Remedial Action Report.	09/2002
Navy removed air stripper from treatment train.	05/2003
Navy installed new A2 extraction well EA2-3.	12/2003
Navy brought new A2 extraction well online.	01/2004
Selected extraction wells temporarily taken off-line to conduct aquifer pump testing	02-03/2004
Extraction wells EA1-1 and EA1-6 temporarily taken off-line to conduct WATS optimization rebound testing	04-11/2004
First 5-year review signed	02/2005
EPA approved final Former Building 88 Investigation Report	03/2008
Navy submitted draft WATS Site 28 Optimization Evaluation Report to EPA	11/2008
Final 2008 Annual Groundwater Report	06/2009
Annual groundwater sampling and quarterly/semi-annual water level monitoring.	Ongoing

Notes:

EPA	U.S. Environmental Protection Agency
MEW	Middlefield-Ellis-Whitman
Moffett Field	Former Naval Air Station Moffett Field
NASA	National Aeronautics and Space Administration
Navy	U.S. Department of the Navy
NPL	National Priorities List
OU	Operable Unit
ROD	Record of Decision
WATS	West-Side Aquifers Treatment System

TABLE 6: CALCULATED CONCENTRATION LIMITS FOR COCs, SITE 1
Five-Year Review Report for IR Sites 1, 22, 26, and 28, Moffett Field, California

Type	COC	CCL (µg/L)
Organic COCs	1,1,1,2-Tetrachloroethane	7,892
	1,1,1-Trichloroethane	6,801
	1,1,2,2-Tetrachloroethane	5,339
	1,1,2-Trichloroethane	162
	1,1-Dichloroethane	6.2
	1,1-Dichloroethene	7.0
	1,1-Dichloropropene	182.0
	1,2,3-Trichlorobenzene	12,900
	1,2,3-Trichloropropane	6.3
	1,2,4-Trichlorobenzene	12,900
	1,2,4-Trimethylbenzene	4,300
	1,2-Dibromo-3-Chloropropane	6,976
	1,2-Dichlorobenzene	10,707
	1,2-Dichloroethane	12,882
	1,2-Dichloropropane	5.4
	1,3,5-Trimethylbenzene	4,300
	1,3-Dichlorobenzene	589
	1,3-Dichloropropane	390
	1,4-Dichlorobenzene	10,707
	2,2-Dichloropropane	5.4
	2-Butanone	2,436
	2-Chlorotoluene	12,900
	2-Hexanone	12
	4-Chlorotoluene	12,900
	4-Methyl-2-Pentanone	236
	Acetone	156
	Benzene	1,001
	Bromobenzene	1,126
	Bromochloromethane	6
	Bromodichloromethane	6
	Bromoform	7
	Bromomethane	7,296
	Carbon Disulfide	0.2
	Carbon Tetrachloride	23,850
	Chlorobenzene	1,117
	Chloroethane	3.3
	Chloroform	3.2

TABLE 6: CALCULATED CONCENTRATION LIMITS FOR COCs, SITE 1 (CONTINUED)

Five-Year Review Report for IR Sites 1, 22, 26, and 28, Moffett Field, California

Type	COC	CCL (µg/L)
Organic COCs	Chloromethane	4.9
	cis-1,2-Dichloroethene	65
	cis-1,3-Dichloropropene	0.2
	Dibromochloromethane	17,280
	Dibromomethane	6,848
	Ethylbenzene	2,160
	Freon 12	11,520.0
	Hexachlorobutadiene	320
	Isopropylbenzene	4,300
	m,p-Xylenes	4.1
	Methylene Chloride	130,432
	Naphthalene	272
	n-Butylbenzene	4,300
	o-Xylene	3.0
	para-Isopropyl Toluene	2,150
	Propylbenzene	4,300
	sec-Butylbenzene	4,300
	Styrene	4,300
	tert-Butylbenzene	4,300
	Tetrachloroethene	23
	Toluene	500,000
	trans-1,2-Dichloroethene	70
	trans-1,3-Dichloropropene	0.2
	Trichloroethene	9.4
	Trichlorofluoromethane	15,360
	Vinyl Chloride	61
	Xylene (total)	3.0
	beta-BHC	340.0
	Heptachlor	0.36
	2,4,6-Trichlorophenol	411
	2-Methylphenol	11
Inorganic COCs	Arsenic	89
	Barium	40
	Cobalt	230
	Copper	5.1

Notes:

CCL Calculated concentration limit

COC Chemical of concern

TABLE 7: MONITORING PARAMETERS FOR SITE 1

Five-Year Review Report for IR Sites 1, 22, 26, and 28, Moffett Field, California

Type	COC
Dissolved Metals	Arsenic
	Barium
	Cobalt
	Copper
VOCs	m,p-Xylene
	Trichloroethene
	Vinyl chloride
Pesticides	Beta-BHC
	Heptachlor
SVOCs	2,4,6-Trichlorophenol
	2-Methylphenol

Notes:

SVOC Semi-volatile organic compound

VOC Volatile organic compound

TABLE 8: CALCULATED CONCENTRATION LIMITS FOR COCs, SITE 22
Five-Year Review Report for IR Sites 1, 22, 26, and 28, Moffett Field, California

Type	COCs	CCL (□g/L)
Organic COCs	Vinyl Chloride	66
	cis-1,2-Dichloroethene ¹	68
	Chloroform ¹	3.5
	Benzene	1316
	Trichloroethene ¹	8.8
	Toluene	500,000
	Chlorobenzene	3354
	Ethylbenzene	4300
	Xylene (total) ¹	13
	1,4-Dichloro-benzene	12,900
	2-Methyl-naphthalene	3,000
	4-Methyl-phenol	130
	bis(2-Ethylhexyl)-phthalate	30
	Carbazole	37
	Dibenzofuran	37
	Diethylphthalate	340
	Fluorene	3,000
	Naphthalene	23,500
	gamma-BHC	1.6
	Aldrin	13

Notes:

¹ indicates that the COC is one of the monitoring parameters for Site 22

CCL Calculated concentration limit

COC Chemical of concern

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